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AUTHOR Stephens, Geralyn E.
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ABSTRACT

Attention has been focused on whether U.S. competitiveness in a global market can be sustained if the work force has deficient reading skills. The U.S. Department of Education estimates that 90 million adults (50 percent of the adult population) do not have the literacy skills they need to function in society. These persons have limited reading skills and are unable to perform simple tasks. Another 40-44 million adults are thought to be functionally illiterate; that is, they fall short of mastery levels in reading and mathematics. A research study focused on answering the following question: Do employees within a given work force demonstrate limited reading skills? Reading comprehension and vocabulary skills were examined using the Test of Adult Basic Education (TABE) with a sample population of 106 employees from a manufacturing company in Dallas, Texas. The findings of the study do not confirm national statistics. The results indicated that the overall reading level exceeds the national average, with the majority of the sample group performing about the 12th-grade level in both reading areas evaluated. Only about 6 percent of the work force scored at the eighth-grade level or below and might benefit from continuing education programs at a higher level than basic literacy. (Contains 12 references.) (KC)

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Workplace Literacy: A view of employee reading levels.

GERALYN E. STEPHENS
Wayne State University

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Abstract

Workplace Literacy: A view of employee reading levels.

Attention has been focused on whether America's competitiveness in a global market can be sustained if the workforce has deficient reading skills. This research focused on answering the question: Do employees within a given workforce demonstrate limited reading skills?

Reading comprehension and vocabulary skills were examined using the Test of Adult Basic Education (TABE). The sample population consisted of 106 employees from a manufacturing company.

The findings of the study do not confirm the national statistics. The results indicated that the overall reading level exceeds the national average. The majority of the sample group performed above the twefth grade level in both reading areas evaluated. The author believes that American companies need to be aware of the conclusions.

The American economy has been shaken by the rapid influx of products produced by an ever-increasing field of competent foreign manufacturers. Some businesses are finding that their employees are functionally illiterate. They do not have the skills needed to use computers and other high-technology machines. These tasks require proficient reading skills.

Our corporate leaders are faced with critical decisions regarding how to improve quality without increasing consumer cost. Rapid changes in manufacturing technology and the need for businesses to exceed customer expectations are also rising concerns. These issues can only be addressed if the American worker is adequately equipped with basic reading skills necessary to navigate the new terrain. This study's major purpose was to measure the reading comprehension and vocabulary levels of employees within an industrial workforce to determine if any acute deficiencies exist that would impede the implementation of new technology at the worksite.

Background

The 21st century will present an interesting challenge for American industrial businesses posed with achieving the aggressive objective of increasing corporate profits while ensuring high levels of product or service quality. The speedy integration of new technology in the manfacturing process plays a critcal role in the longevity of industrial revolution survivors. Employees with inadequate reading skills can quickly hamper any company's progress intended to be made through the purchase of sophisticated machinery.

Reich (1988) indicates that the world has become a global economy and the marketplace is much more competitive. US corporations are competing with foreign businesses which often can produce goods for far less labor expense. Therefore, US products must be of the highest quality to justify their costs. Reich further states that one in three US corporations provide basic skills training for

employees. He speculates that remedial education for industry could cost upwards of $25 billion every year. This form of corporate training is called Pre-remedial training. This is the training required to develop workers into avid new-skills learners (Carlivati, 1990).

Mikulechky (1990) states these companies which must provide workers with remedial courses before beginning any form of technical training face delays in implementing new technologies and work practices. These basic skills problems can also hamper employee participation in productivity and quality improvement efforts. Knell (1990, p. 22) states that "one of every eight employees reads at no more than fourth-grade level, and one of five at the eighth-grade level."

In 1991, Bell suggested that the literacy profile of a typical midsize US business is one in which ten percent of the workers are marginally literate, 65 percent function at a level between fourth grade and ninth grade, and only 25 percent function at above a tenth grade literacy level. Employees with minimal skills are causing lower productivity, workplace accidents, customer dissatisfaction, and problems with learning new technology. The federal government projects that approximately 50 percent of the American adult population has limited reading skills.

The US Department of Education (National Center for Educational Statistics [NCES], 1993) estimates that 90 million adults in the country do not have the literacy skills they need to function in American society. The report indicates these individuals are unable to read, write, calculate or solve problems at a level that enables them to perform and/or understand simple tasks. The report further states that there are 40 to 44 million adults who are functionally illiterate. They fall short of mastery levels in the foundational skill areas of reading and mathematics. During this decade, it is estimated that 25 million

American workers will need to upgrade their skills, if the US economy is to remain competitive in a global marketplace.

The literature suggests that there are large numbers of employed Americans without the reading skills required to function effectively in a high performance workplace. If so, this condition could have a tremendous effect on America's competitiveness in a global marketplace. The research detailed here focused on answering the question: Do employees within a given workforce demonstrate limited reading skills?

Method

This study sought to examine whether a specific workforce's overall reading levels mirrored the results of other related investigations. Results were based on the overall performance of the sample population on a standardized test which measures reading competency levels in comprehension and vocabulary.

The sample was drawn from an industrial service and manufacturing company headquartered in Dallas, Texas. The company has a workforce of 179 employees. The sample consisted of 106 employees (59 percent of the population) from all areas of the organization. The group was occupationally diverse. Participants included engineers, skilled tradesmen and office and maintanence personnel. Due to the nature of the company's business, Commercial Boilermaking, 88 percent of the sample population was male.

All members of the sample population voluntarily participated in the study. Farris (1992) states adults with literacy problems do not find it difficult to admit that they are weak in this area. It is the literate majority that fails to acknowledge that the country has a massive problem and does very little to address the issue. All of the respondents to the American Society of Training and Development (1993) Literacy Training survey indicated participation in their

programs is strictly voluntary. This philosophy was adopted for the study.

To ensure confidentiality, each participant selected their own four digit number to be used for tracking purposes. No other form of identification was required. A member of the line staff performed the functions assigned to the Registrar.

The Registrar scheduled a participant for a particular session, made any required adjustments of work schedules and arranged transportation to the testing facility. At the testing session, the participant received an empty envelope and index card. The participant selected a four-digit number. The number was entered on each test answer sheet and on the index card. The participant placed his/her name on the outside of the envelope and placed the index card inside. After the numbers were logged into a computer and sorted to ensure that a duplicate did not exist, the envelopes were sealed by the participant. The testing sessions were conducted during May 1994. Two four-hour testing sessions were conducted daily, over a two-week period.

At the time the study was undertaken, there were no published instruments designed to assess specific workplace reading skill ability. In a major report which evaluated published Literacy Tests, Short & Grognet (1988) found that none of the tests were designed to assess the actual demands placed upon workers in the workplace. After careful evaluation, the Tests of Adult Basic Education - Form 5 (TABE, 1979) was selected for use. The instrument is also referred to as the TABE Total Battery.

The TABE Locator Test was administered before the TABE Total Battery test. The TABE Locator consists of 25 vocabulary items. This test pre-evaluates the learner's ability so the assignment of TABE Total Battery levels will most accurately assess the learners' reading ability level.

The reading comprehension section of the TABE Total Battery contained

40 items. These items examined the learners' ability to extract detail, analyze characters, identify main ideas, and interpret events described in passages. This section also tested the learners' ability to differentiate various forms of writing and writing techniques. Each TABE level contained items which examined all of these objectives.

The Reading Vocabulary section of the assessment measures same meaning words, opposite-meaning words, multi-meaning words, the meaning of affixes, and words in context. All of the performance objectives in the Reading Vocabulary section were examined across all TABE levels.

Results

The results are stated in grade level form. Kozol (1985, p.10) indicates that using grade levels as benchmarks for proficiencies "is a function of the need to offer standards that may have some meaning for those citizens whose only reference points are those which are familiar from their years in public school".

The TABE Total Battery scores are reported in Scale Score values. The scale scores are on a continuous scale across the test levels and are used to derive other score types, such as Grade Equivalence. The Grade Equivalence (GE) indicates the grade placement of a participant for whom a given score is typical. As an example, a grade equivalence of 7.8 means that this score is typical of a student in the eighth month of the seventh grade.

Table 1 details the TABE levels administered to the sample group. The levels administered were determined by the participant's combined reading and vocabulary score on the TABE Locator test. Over 82 percent of the group performed well enough on the TABE Locator test to be given the Advance level of the TABE Total Battery test. Given these preliminary results, it was expected that reading scores have been grade equivalence of 8.6 or greater on the TABE Total Battery.

Table 1

TABE Reading Test Administered

Level	Grade Range	N	Percent
E (Easy)	2.6 - 4.9	2	1.89
M (Medium)	4.6 - 6.9	9	8.49
D (Difficult)	6.6 - 8.9	8	7.55
A (Advanced)	8.6 - 12.9	87	82.07

Reading Comprehension Skills

Inadequate Reading Comprehension skills can cause complications in the workforce with reading manuals, user guides and operating instructions. Most of these materials require a reading skill level of at least the tenth grade. Results of the study revealed four percent of the sample population scored below the sixth grade level in Reading Comprehension.

Table 2 provides the frequency distribution of Reading Comprehension scores. Ninety-four percent perform above the eighth grade completion level. Over 70 percent demonstrated reading comprehension skills GE 12.0 or better. However, approximately 30 percent of the workforce is functioning below the twelfth grade completion level. Fourteen percent performed at or below the ninth grade level.

Table 2

Cumulative Frequency Distribution of Reading Comprehension Scores

GE	*f*	Cumulative *f*	Cum Percentage
2.0--3.0	0	0	0
3.0--4.0	0	0	0
4.0--5.0	1	1	.94
5.0--6.0	3	4	3.77
6.0--7.0	1	5	4.71
7.0--8.0	1	6	5.66
8.0--9.0	9	15	14.15
9.0--10.0	4	19	17.92
10.0--11.0	10	29	27.35
11.0--12.0	1	30	28.30
12.0--12.9+	76	106	100.0

Note. GE = Grade Equivalence for each group.

Reading Vocabulary Skills

The results in Reading Vocabulary shows the majority of the sample population performed above the tenth grade level. Seventy-seven percent scored between the eleventh and twelth grade levels. Only ten percent scored less than the ninth grade level. Detailed results are depicted in Table 3.

Careful review of the group's performance on specific objectives revealed the majority scored above the 70 percent mastery level on all objectives except on items related to the identification of synonyms . Synonyms are words which have the same meanings. Slightly more than 52 percent of the group experienced difficulty in this area. The participants experienced very few problems with objectives related to assessing their understanding of meanings of affixes and

words in context.

Table 3

Cumulative Frequency Distribution of Reading Vocabulary Scores

GE	*f*	Cumulative *f*	Cum Percentage
2.0--3.0	1	1	.94
3.0--4.0	1	2	1.89
4.0--5.0	1	3	2.83
5.0--6.0	1	4	3.77
6.0--7.0	5	9	8.49
7.0--8.0	6	11	10.38
8.0--9.0	0	11	10.38
9.0--10.0	3	14	13.21
10.0--11.0	3	17	16.04
11.0--12.0	7	24	22.64
12.0--12.9+	82	106	100.0

Note. GE = Grade Equivalence for each group.

Overall Reading Skills

The Reading Composite score combined both Reading Vocabulary and Reading Comprehension scores. A distribution of these scores is illustrated in Table 4. Eighty-two of the 106 participants, 78 percent, scored within the eleventh and twelfth grade levels in the Reading Vocabulary section of the TABE Test.

Table 4

Cumulative Frequency Distribution of Reading Composite Scores

GE	*f*	Cumulative *f*	Cum Percentage
2.0--3.0	1	1	.94
3.0--4.0	1	2	1.89
4.0--5.0	1	3	2.83
5.0--6.0	0	3	2.83
6.0--7.0	3	6	5.66
7.0--8.0	2	8	7.55
8.0--9.0	3	11	10.38
9.0--10.0	5	16	15.09
10.0--11.0	3	19	17.92
11.0--12.0	4	23	21.7
12.0--12.9+	83	106	100.0

Note. GE = Grade Equivalence for each group.

An examination of Table 4 reveals that nearly 18 percent of the sample population have an overall reading skill level below the eleventh grade level. Ten percent scored below the ninth grade completion level. However, the group scored well above the national average of GE 5.4.

Conclusions

The findings from this study clearly do not support the proposition that the entire American workforce suffers from illiteracy. This research was conducted with volunteer employees of a southwestern manufacturing company. Similar results might not be obtained elsewhere. There may be many other workplaces throughout the United States where the results will be applicable.

The sample group's overall reading levels are high, averaging above the

12.0 grade equivalency in Reading Comprehension. However, 7 percent of the sample population scored below the eleventh grade level. They would benefit from a Remedial reading instructional program that includes a reading comprehension module. The reading program should consist of at least 56 hours of reading instruction. According to Rupert (1988) this should result in a grade level gain of about two years.

An Adult Basic Education (ABE) program is an avenue for adult learners to acqire reading remediation instruction. However, only 2.83 percent of the sample population met the criteria used to define an 'Educationally Disadvantaged Adult' in the Adult Education Amendments of 1988. The legislation identifies this individual as "an adult who demonstrates basic skills equivalent to or below that of students at the fifth grade level...". This could possibly create financing issues for those participants, who are seeking ABE assistance, that scored above this level.

It is also clearly evident that Adult Basic Education programs designed to address the needs of the typical ABE learner will not meet the specific needs of this sample group. The sample population has demonstrated reading skill levels well above the average Adult Basic Education enrollee. However, ten percent of the sample population do need an instructional program designed to enhance reading levels above the ninth grade competency level.

Knell (1990) reported that 20 percent of the average workforce has reading skill levels at the eighth grade. This study's findings does not support this conclusion. Six percent of the sample population achieved Reading composite scores at the eighth grade level on the TABE Total Battery. Seventy percent scored above the twelfth grade level.

Recommendations

There has been national attention and concern regarding the reading levels

of the American workforce. These findings corroborated those of Carnevale (1990) who concluded that the majority of the American workforce is literate. However, effective communication can be severely hampered when disparities exist within a workforce. The inconsistencies can create barriers which must be overcome before any higher level training is attempted.

Companies should continue with their efforts to increase productivitiy by securing new technology. Employees, in the study, do possess the basic reading skills needed to use the supporting materials. Adults internalize and relate quicker to new materials and concepts that have familiar premises. If the technology supports an existing occupational activity, most workers will grasp the information quickly.

Employees must begin to demonstrate they posess proficient reading ability. A personal commitment must be made to lifelong learning. By making this investment in self, employees will not only keep their companies competitive, but will increase their scope of understanding as well.

Once more sophisticated instrumentation has been developed, further investiagtion should focus on determining whether specific work-related reading weaknesses exist within the workforce.

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